Metrology and Instrumentation Challenges in Nanomanufacturing

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ABSTRACT

As the ability to fabricate at the nanoscale evolves to the desire to reap the benefits of manufacturing at the nanoscale, the demands on metrology and instrumentation will increase dramatically. While scanning probes have the spatial resolution to image surfaces the atomic scale, their inherent non-linearity's and drift present major difficulties and the uncertainties of the tip structure lead to uncertainties in measurement and typically restrict imaging to near atomically flat surfaces. Atom probe technology is an intriguing technology which has the promise of atom by atom deconstruction of structures with atomic resolution and elemental identification. However, there are currently significant limitations on what may be characterized with this destructive technique. The presentation will discuss the improvements required for these and other techniques that will be required for the coming drive toward atomically precise manufacturing.